(19) Europäisch s Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 488 312 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **91120431.1**

(51) Int. Cl.5: **E04F 15/024**

(22) Date of filing: **28.11.91**

(30) Priority: **29.11.90 JP 333075/90**
29.11.90 JP 333076/90

(43) Date of publication of application:
03.06.92 Bulletin 92/23

(84) Designated Contracting States:
DE FR GB

(71) Applicant: **Kabushiki Kaisha Toshiba**
72, Horikawa-cho Saiwai-ku
Kawasaki-shi(JP)

(72) Inventor: **Takeda, Fumio, c/o Intellectual Property Division**
Kabushiki Kaisha Toshiba, 1-1 Shibaura 1-chome
Minato-ku, Tokyo 105(JP)
Inventor: **Kojima, Yoshio, c/o Intellectual Property Division**
Kabushiki Kaisha Toshiba, 1-1 Shibaura 1-chome
Minato-ku, Tokyo 105(JP)
Inventor: **Ishibashi, Yutaka, c/o Intellectual Property Div.**
Kabushiki Kaisha Toshiba, 1-1 Shibaura 1-chome
Minato-ku, Tokyo 105(JP)
Inventor: **Tsushima, Isako, c/o Intellectual Property Div.**
Kabushiki Kaisha Toshiba, 1-1 Shibaura 1-chome
Minato-ku, Tokyo 105(JP)
Inventor: **Sugimoto, Kenji**
3-3-10, Takada
Chigasaki-shi, Kanagawa-ken(JP)
Inventor: **Tanaka, Hideo**
2-13-12, Shichirigahama
Kamakura-shi, Kanagawa-ken(JP)
Inventor: **Takahashi, Hidetoshi**
2-16-32, Konan
Konan-ku, Yokohama-shi(JP)
Inventor: **Sumiyoshi, Fumio**
3-1-52, Koyata
Iruma-shi, Saitama-ken(JP)

(74) Representative: **Henkel, Feiler, Hänzel & Partner**
Möhlstrasse 37
W-8000 München 80(DE)

(54) Method for manufacturing system floor and floor base for system floor.

(57) The present invention provides a floor panel (3) comprising a rectangular floor base (1) integrally forming each convex prop (13) in each corner portion and a concave portion (11b) on the upper surface of each prop, a height adjusting screw with a plate embedded in the concave portion of each prop, variably adjusting the height of the support position in a predetermined range between a lower position than the upper surface of the prop and a higher position than the upper surface of the prop, and a floor panel (3) supported by each prop of the floor base and having a through hole (30) of a jig adjusting the support position of said height of the adjusting parts in each corner according to the prop. In the method of manufacturing the floor base, convex portion (11a), which integrally projects to the upper surface side on four corners of of a skin (11), is formed, a concave portion (11b) is formed on the lower surface of said convex portion, concrete (12) is packed in the concave portion (11b), and a prop is formed to be integrated with said skin.

EP 0 488 312 A1

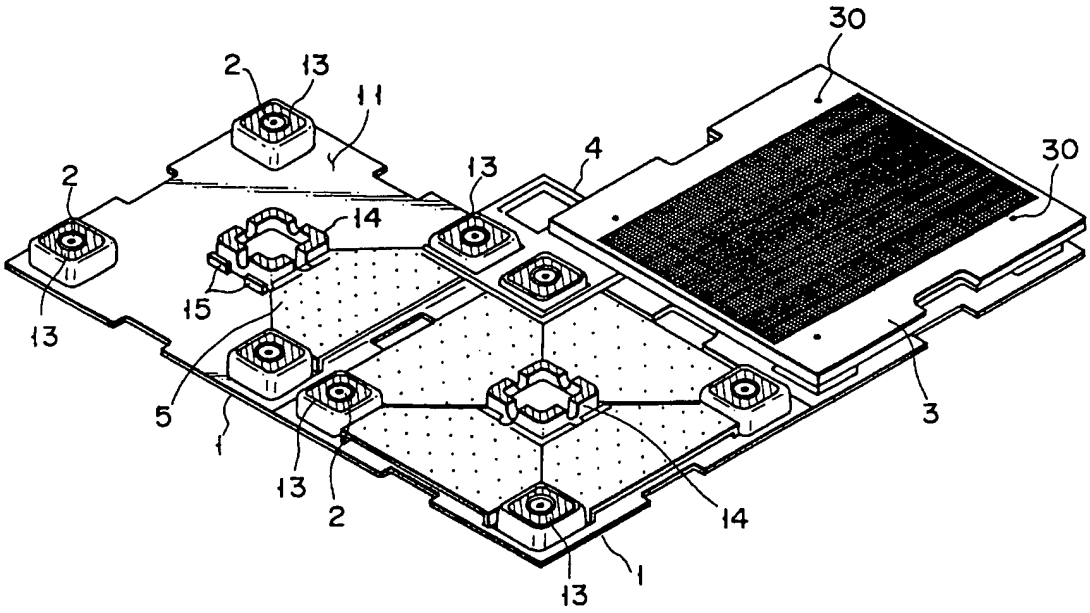

FIG. 1

The present invention relates to a method for manufacturing a system floor and a floor base for the system floor which are used to provide an underfloor shielding wire such as a power cable and a signal cable for various types of equipments realizing an office automation.

In conventional, as a system floor which is used to provide an underfloor shielding wire such as a power cable and a signal cable for various types of equipments realizing an office automation, for example, Published Unexamined Japanese Utility Model Application No. 61-76045 discloses the following structure:

Insertion blocks having specific forms to be engaged with each are integrally formed on a peripheral portion of a rectangular floor base to be formed on a base floor. Then, the rectangular floor base is formed on the surface of the base floor as the insertion blocks are coupled to each other.

Moreover, Published Unexamined Japanese Patent Application No. 60-40472 discloses the following structure:

A plurality of props is formed on a lower unit, and an upper unit is mounted to be fixed to the lower unit by these props, thereby the upper unit is formed on the surface of the basic floor.

However, in the above-mentioned conventional structure, there are problems in the various points such as construction workability, conformability, and the like. More specially, in the above-mentioned conventional structure, a bottom plate or a bottom portion of a base member, which is called a base plate, are shaped flat. Due to this, a rickety state is generated if the base member is not formed to be flush with the surface of the base floor, so that conformability to the surface of the base floor is lost. In this case, in order to form the base member to be flush with the surface of the base floor, a high flat accuracy is required in finishing the surface of the base floor. Therefore, there are problems in the various points such as a construction cost, a construction period of time, and workability.

Moreover, in the structure in which the floor base is formed on the surface of the base floor as the insertion blocks are coupled to each other, mutual insertion work of the blocks are need between the adjacent floor bases on each side (four sides). Due to this, it requires much labor and time to carry out the construction working including the above mutual insertion work, and there is a problem in that workability worsens. Moreover, in the structure of the mutual insertion work of the blocks, if the mutual insertion of the blocks is tightened so as to firmly and integrally couple th floor bases to each other, much time is required by the construction work and workability worsens more and more. Furthermore, conformability to the surface of the base floor also worsens. If the mutual insertion of the blocks is loosened, the construction work is made easy. However, the floor bases cannot be firmly and integrally coupled to each other, and stability of the upper floor surface and flatness are lost.

Moreover, in the structure in which the upper unit is mounted to be fixed to the lower unit by the plurality of props, since the lower units are arranged on the surface of the base floor and the upper units are mounted to be fixed thereto, the construction work is relatively easily carried out. However, since the lower units are integrally coupled to each other, the stability of the upper floor surface and flatness are lost.

In order to solve the above problems, Japanese Patent Application No. 1-242835 discloses a floor base having the structure in which the props having the same height are formed on each latticed frame cross section, and support a floor panel at many points, and conformability to the surface of the base floor is good and construction work can be easily carried out.

However, in the above-structured floor base, since the number of the props is integrally formed on the latticed frame, the construction becomes complicated and there are problems in the manufacturing cost and treatment.

An object of the invention is to provide a floor system in which the construction work including the simple structure having the number of parts is reduced and the flat adjustment is simply and quickly carried out, and durability and conformability are improved.

Another object of the present invention is to provide a method for manufacturing a floor base in which the number of structural parts can be minimized and the floor base can be easily manufactured with reasonable cost.

The system floor of the present invention comprises a rectangular floor base in which each convex prop is integrally formed at each of four corners and a concave portion is formed on the surface of the prop; an adjusting part, which is embedded in the concave portion of each prop and can variably adjust the height of the support position in a predetermined range between a lower position than the upper surface of the prop and a higher position than the upper surface of the prop; and a floor panel, which is supported by each prop of the floor base and has a through hole of a jig adjusting the support position of the height of the adjusting parts in each corner according to the prop. Thereby, the flat adjustment can be easily carried out with the simple structure in which th number of the parts is reduced, and the construction work is easily and quickly carried out.

Moreover, the system floor of the present in-

vention comprises a floor base forming a convex portion integrally projecting to the upper surface side on at least four corners of rectangular synthetic resin sheet, serving as a skin, and packing concrete in the concave portion formed on the lower surface of the convex portion and forming a prop to be integrated with the sheet; and a floor panel engaged with the prop of the floor base and supported thereby. Thereby, there can be provided the floor structure in which the number of the parts can be reduced, the structure is simplified, the construction work can be easily and quickly carried out, the manufacturing cost can be reduced, and durability and conformability are improved.

A manufacturing method of the floor base of the present invention comprises the steps of forming a convex portion integrally projecting to the upper surface side on at least four corners of rectangular synthetic resin sheet, serving as a skin; forming a concave portion on the lower surface of the convex portion; and packing concrete in the concave portion; hardening the concrete; and forming a prop to be integrated with the skin. Thereby, the number of the structural parts is minimized, the floor can be easily manufactured with the simple structure and reasonable cost.

This invention can be more fully understood from the following detailed description when taken in conjunction with the accompanying drawings, in which:

Fig. 1 is an exploded perspective view showing the entire structure of a floor panel according to one embodiment of the system floor of the present invention;

Fig. 2 is a plane view showing the floor base shown in Fig. 1;

Fig. 3 is a cross sectional view taken along the line A - A of Fig. 2;

Fig. 4 is a cross sectional view taken along the line A - A of the structure in which reinforcing processes (concrete packing and hardening process) for a prop is added to a skin of the Fig. 3;

Fig. 5 is a cross sectional view showing an enlarged structure of the prop portion shown in Figs. 1 to 3;

Fig. 6 is a cross sectional view showing a state that an electrical part is attached to a central prop (auxiliary prop) shown in Figs. 1 to 2;

Figs. 7A and 7B are perspective views showing the structure of the floor panel shown in Fig. 1; and

Fig. 8 is a perspective view showing a rib structure of the floor panel in the other embodiment of the system floor of the present invention.

Embodiments of the present invention will be explained with reference to the drawings.

Figs. 1 through 6 show one embodiment of the present invention. Fig. 1 is an exploded perspective view showing the entire structure of a floor panel. Fig. 2 is a plane view showing the floor base. Fig. 3 is a cross sectional view taken along the line A - A of Fig. 2. Fig. 4 is a cross sectional view showing the enlarged structure of a prop portion of the corner shown in Figs. 1 and 2. Fig. 5 is a cross sectional view showing a state that an electrical part is attached to a central prop (auxiliary prop) shown in Figs. 1 to 2. Fig. 6 is a perspective view showing the structure of the floor panel shown in Fig. 1.

In Figs. 1 through 6, reference numeral 1 is a floor base formed on a surface B of a base floor. Reference numeral 11 is a skin, which is a structural element of the floor base 11 and formed of rectangular synthetic resin to which a press molding process is added. In the skin 11, there are formed convex portions 11a, 11a, ..., 11c integrally projecting to the upper surface side in the four corners and the central portion and concave portions 11b, 11b, ..., 11d on the lower surface side by the press molding process.

In the skin 11 in which concave portions 11b, 11b ..., 11d in the prop forming portion, concrete 12 is packed in each of the concave portions 11b, 11b, ..., 11d in a state that the openings of the concave portions 11b, 11b, ..., 11d are directed upward, and the concrete is hardened, thereby forming a central auxiliary prop 14 whose height is slightly lower than the props 13, 13, ... formed at the four corners. In this case, as concrete 12 to be packed in the concave portions 11b, 11b, ..., 11d, there is used ultra-high-strength special light-weight concrete, which is formed of high strength inorganic material mixing a composition containing cement, silica, a special addition agent with thermosetting melamine resin. Then, concrete 12 packed in each of the concave portions 11b, 11b, ..., 11d is hardened by applying vibration to the skin 11.

Thereby, as shown in Fig. 4, there can be generated the floor base 1 having the props 13, 13, ..., with high strength of the four corners in which concrete 12 having extremely high compression is packed as reinforcing material, and the auxiliary prop 14.

On the upper surface of the skin 11, there are formed two hooking projections 15 for a separation hook are formed in each side to be separated from an outer wall surface of the auxiliary prop 14. On an edge portion of each side, there are formed two butting projections 16 for preventing the overlap of the skin of the adjacent floor base 1. Further, on the upper surface of the skin 11, there are formed projection line portions 17 (see Fig. 2) having a drain hole 17a in both end portions of the longitudinal direction other than the above-mentioned projections.

On the floor base 11 in which concrete 12 is packed in the concave portions 11b, 11b, ... 11d of the skin 11 and props 13, 13, ... 14 are integrally formed, there is formed an adjusting screw 2 with a plate for adjusting the height is embedded in the upper surface of each of props 13, 13, ... of the four corners. More specifically, on the upper portion of the convex portion of 11a, 11a, ..., constituting the props 13, 13, ... on the skin 11, from the upper side, there are formed a storing hole 131 for a base seat portion 121 of the adjusting screw 2 with plate, a storing and holding hole 132 for a nut 23 is screwed to a bolt 22 (see Fig. 5) of the adjusting screw 2 with plate, and a relief hole 133 for the bolt 22 of the adjusting screw 2 with plate in a stepped form. The adjusting screw 2 with plate, which comprises the base seat portion 21, the bolt 22, and the nut screwed to the bolt 22, is stored in the concave portion having these holes 131, 132, and 133. An angular hole 21a engaging with a hexagonal wrench is formed in the central portion of the upper portion of the base seat portion 21 of the adjusting screw 2 with plate. The hexagonal wrench is inserted into the angular hole 21a through a wrench through hole 30 formed on the four corners of the floor panel 3, thereby making it possible to easily adjust the height of each of the props 13, 13, ... from the upper surface of the floor panel 3 (the rickety state of the floor panel 3 and the height). Moreover, a U-shape groove 14a (see Fig. 6) is formed in each side of the auxiliary prop 14. Then, as shown in Fig. 6, if an electrical part 51 such as a power plug socket, a distributor, a connector, a receiver, a transmitter, and the like is embedded in the auxiliary prop 14, the groove 14a is used as an outlet for a cable 52 or an inlet.

A floor panel 3, is supported at a constant position on the floor base 1 through props 13, 13, ... In this case, as shown in Fig. 6, there are formed wrench-through holes 30 are formed at four corners corresponding to the adjusting screws 2 for a plate, which are embedded in the upper surface of each of the props 13, 13, ... formed in the floor base 1, and for adjusting the height. Moreover, rectangular opening portions 31, 31 are respectively formed in the opposing two sides. Also, a main rib 32 having a constant width is formed in the peripheral portion of the lower surface, and an auxiliary rib 33 is formed in a face portion other than the main rib 32. Moreover, in the lower portion of the floor panel 3, there are formed prop connecting portions 34 and 35 connecting to the respective props 13, 13, ..., 14 formed in the floor base 1 through a shock absorbing member in a state that they are enclosed with the main rib 32 and the auxiliary rib 33. At the time of construction, the respective props 13, 13, ..., 14 are engaged with the respective ribs 32 and 33, and the floor panel 3 is fixed at the constant position on the floor base 1. In this case, in a state that a large load is not applied to the floor panel 3, a load, which is applied to the shock absorbing member between the auxiliary prop 14 formed in the central portion on the floor base 1 and the prop connecting portion 35 formed in the central portion of the lower surface of the floor base 3, is considerably small. The prop connecting portions 34 and 35 or the thickness of the shock absorbing member are adjusted such that a large load is applied to the base panel 3, thereby the auxiliary prop 14 of the central portion functions upon receipt of a part of the load. Moreover, as shown in Fig. 6, if the electrical part 51 such as the power plug socket, the distributor, the connector, the receiver, the transmitter, and the like is embedded in the auxiliary prop 14, there is used a floor panel 3s in which a hole is formed, in advance, in the prop connecting portion 35 formed to correspond to the auxiliary prop 14 of the back surface of the panel shown in Fig. 7B.

A connection piece 4 has an insertion hole to which the props 13 of the corner portions are inserted. The connection piece is inserted into the props 13, 13, ... of the corners when the adjacent floor bases 1, 1, ... are mutually connected.

A horizontal separator 5 forms a wiring layer. The separator 5 is hooked on two hook projection portions 15 and 15 formed on each side to be spaced from the outer wall surface of the auxiliary prop 14 on the floor base 1 and which is guided to an arbitrary space on the floor base 1 to be divided in the upper and lower directions. In this case, a hinge portion is formed on the upper side of the hook portion to be opened upward. Normally, the horizontal separator 5 is secured to a fixed position where the space between the floor base 1 and the floor panel 3 is divided into two by a leg portion formed on both sides of the hook portions.

As mentioned above, concrete 12 is poured into the concave portions 11b, 11b, ..., 11d of the skin 11, and hardened for a short period of time by applying vibration to the skin 11. By this simple and easy manufacturing method, there can be efficiently manufactured the floor base 1 integrally having strong props 13, 13, ..., 14. Moreover, in the above-mentioned floor base 1, since the skin 11 formed of the rectangular synthetic resin sheet can be formed on the main body (base) and strong props 13, 13, ..., 14 can be integrally formed, the floor base can be manufactured with low cost by the simple manufacturing method and the structure having the small number of parts.

The construction work of the above-structured system floor will be carried out as follows:

First, the floor bases 1, 1, ... are sequentially juxtaposed on a basic floor surface B such that their ends are arranged in order. Then, the connec-

tion pieces 4 are inserted into the props 2, 2, ... of the corners, thereby the juxtaposed floor bases 1, 1, ... are coupled to each other. The floor bases 1, 1, ... can be formed on the base floor surfaces B by this simple manner. Thereafter, the horizontal separator 5 is fixed to be hooked to the arbitrary hook projection portions 15, 15 on the floor base 1, and a predetermined wiring passage, a duct and the like are formed, and a predetermined wiring process is carried out. Thereafter, the floor panels 3, 3, ... are mounted on the floor bases 1, 1, ... In this case, the floor panels 3 are supported on the props 13 of four corners, which are formed on the floor bases 1, and the central auxiliary prop 14 through the shock absorbing material. Moreover, the props 13 of four corners are engaged with the main rib 32 of the floor panel 3 and the central auxiliary prop 14 is engaged with the auxiliary rib 33, thereby the floor panel 3 is secured to the fixed position on the floor base 1. In this case, a load to be applied to the floor panel 3 is dispersed and the dispersed load is applied to the props 13 serving as a main prop, and the prop 14 serves as an auxiliary prop. In a state that a large load is not applied to the floor panel 3, a load, which is applied to the shock absorbing member between the auxiliary prop 14 formed in the central portion on the floor base 1 and the prop connecting portion 35 formed in the central portion of the lower surface of the floor base 3, is considerably small. The large load is applied to the floor panel 3, thereby the auxiliary prop 14 of the central portion functions upon receipt of a part of the load.

Moreover, in a case where the power plug, the distributor, and the connector are formed on the floor in a state that the floor mat is spread on the upper surface of the floor panel 3, these arbitrary electrical parts 51 are embedded in the auxiliary prop 14, and the cable 52 is formed through the groove 14a formed in the wall portion of the auxiliary prop 14, as shown in Fig. 6. Thereby, the various types of electrical parts 51 can be easily provided in the surface of the floor. In this case, in accordance with the mount of the electrical parts 51, there is used a floor panel 3s in which a hole is formed, in advance, in the prop connecting portion 35 formed to correspond to the auxiliary prop 14 of the back surface of the panel shown in Fig. 7B.

The adjustment of flatness after the floor panel 3 is constructed and that of the rickety state are performed as follows.

The hexagonal wrench is inserted into one of wrench-through holes 30 formed in the four corners of the floor panel 3. The top end of the wrench is engaged with the angular hole 21a, which is formed in the central portion of the upper portion of the base seat portion 21 of the adjusting screw 2 with plate. Then, the adjusting screw is rotated, thereby the adjustment of height can be performed in a state the floor panel 3 is constructed.

The construction of the system floor (multifunctional system floor) is completed through the above-mentioned working.

In the above-structured system floor shown in the embodiment, the skin 11 formed of the rectangular synthetic resin sheet is formed in the main body (base) and strong props 13, 13, ..., 14 can be integrally formed. The floor base 1 can be manufactured by the simple manufacturing processes and the floor base 1 can be easily manufactured by the small number of parts. Thereby, the system floor having high reliability can be provided with low cost. Moreover, the main rib 32 and the auxiliary rib 33, which are formed in the lower portion of the floor panel 3, are respectively engaged with the props 13 and 14 of the corner portions and the central portion, which are formed on the floor base 1. Then, the floor panel 3 is supported at the constant position on the floor base 1. Due to this, by the simple structure having the ribs 32 and 33 serving as the reinforcing members for the floor panel 3, the floor panel 3 can be secured to the fixed position on the floor base and supported. Also, the weight of the floor panel can be lightened and the cost thereof can be reduced. Moreover, the floor structure can be simplified and easily and quickly constructed. Furthermore, the floor structure has high durability to fully withstand the large load.

According to the above-mentioned embodiment, the floor panel 3 is supported at the fixed position on the floor base 1 by the props 13 of the corners and the auxiliary prop 14 of the central portion, which are formed on the floor base 1. Moreover, the auxiliary prop 14 of the central portion functions when the large load is applied to the floor panel 3. Due to this, by use of the structure having the minimum number of props, there can be realized the system floor having high durability to fully withstand the large load, and excellent conformability.

Fig. 8 shows the rib structure of the floor panel according to the other embodiment. This embodiment shows the floor panel structure having a rib, which are shaped in parallel crosses, and which is parallel with each side. The props 13 of the corners are engaged with two sides of the rib, and the floor panel is supported at the fixed position on the floor base 1.

In the above embodiment, the floor panel 3 is supported by five props 13 and 14 formed on the floor base 1. However, it is possible to support the floor panel 3 by four props 13 of the corners. Moreover, according to the above embodiment, the respective convex portions 11a and 11c, which are integrally project to the upper surface side, are

formed in the four corners of the skin 11 and the central portion. The concave portions 11b and 11d are formed in the lower surface side, and ultra-high-strength special light-weight concrete 12 is packed therein, thereby there is formed the central auxiliary prop 14, which is slightly lower than the props 13 of the four corners, to be integrated the skin 11. However, it is possible to pack hardening material such as the other concrete material in the concave portions 11b and 11d. Moreover, the structure of the floor base and that of the floor panel are not limited to the above-mentioned structure, and the other sheet-like material may be used.

Claims

1. A system floor, comprising:
   a rectangular floor base (1) integrally forming each convex prop (13) in each corner portion and a concave portion (11b) on the upper surface of each prop;
   a height adjusting part (2) embedded in the concave portion of each prop, variably adjusting the height of the support position in a predetermined range between a lower position than the upper surface of the prop and a higher position than the upper surface of the prop; and
   a floor panel (3) supported by each prop of the floor base and having a through hole (30) of a jig adjusting the support position of said height of the adjusting parts in each corner according to the prop.

2. A system floor, comprising:
   a rectangular floor base (1) integrally forming each convex prop (13) in each corner portions and a central portion, and a first concave portion (11b) on the upper surface of the prop of each and a second concave portion (11d) on the upper surface of the prop of the central portion;
   a height adjusting part (2) embedded in said first concave portion of each prop, variably adjusting the height of the support position in a predetermined range between a lower position than the upper surface of the prop and a higher position than the upper surface of the prop;
   an electrical part (51) selectively embedded in said second concave portion of each prop; and
   a floor panel (3) supported by at least each prop of said floor base and having a through hole (30) of a jig adjusting the support position of said height of the adjusting parts in each corner according to said props, a hole portion where the upper surface of the electrical part is exposed to the central portion.

3. The system floor according to claim 1, characterized in that said height adjusting part (2) comprises a nut (23) embedded in the concave portions, and a bolt (22) with a seat screwed to said nut.

4. The system floor according to claim 2, characterized in that said height adjusting part (2) comprises a nut (23) embedded in the concave portions, and a bolt (22) with a seat screwed to said nut.

5. A system floor, comprising:
   a floor base (1) forming a convex portion (11a) integrally projecting to the upper surface side on at least four corners of rectangular synthetic resin sheet, serving as a skin, and a concave portion (11b) in the lower surface thereof and packing concrete (12) in said concave portion, and forming a prop to be integrated with said sheet; and
   a floor panel (3) engaged with said prop of said floor base and supported thereby.

6. A system floor, comprising:
   a floor base (1) forming convex portions (11a, 11c) integrally projecting to the upper surface side on at least four corners of rectangular synthetic resin sheet, serving as a skin, and a central portion, concave portions (11b, 11d) in the lower surface of each convex portion, and packing concrete (12) in said concave portions, and forming a main prop (13) to be integrated with said sheet and an auxiliary prop (14) in the central portion of said sheet; and
   a floor panel (3) engaged with said prop of said floor base and supported thereby.

7. The system floor according to claim 5, characterized by further comprising a floor base (1) wherein a nut embodying concave portion (132) projecting into said concave portion (11b) is formed in the upper portion of the convex portion (11a), and a nut (23) is embedded in said nut embodying concave portion, a height adjusting bolt (22) of the floor panel (3) being screwed in the nut.

8. The system floor according to claim 6, characterized by further comprising a floor base (1) wherein a nut embodying concave portion (132) projecting into said concave portion (11b) is formed in the upper portions of the convex portions (11a, 11c), and a nut (23) is embedded in said nut embodying concave potion

wherein a height adjusting bolt (22) of the floor panel (3) being screwed in the nut.

9. The system floor according to claim 1, characterized in that a butting projection (16) for preventing the overlap of the adjacent floor base (1) is formed in an edge portion or a part of the edge portion.

10. The system floor according to claim 2, characterized in that a butting projection (16) for preventing the overlap of the adjacent floor base (1) is formed in an edge portion or a part of the edge portion.

11. The system floor according to claim 5, characterized in that a butting projection (16) for preventing the overlap of the adjacent floor base (1) is formed in an edge portion or a part of the edge portion.

12. The system floor according to claim 6, characterized in that a butting projection (16) for preventing the overlap of the adjacent floor base (1) is formed in an edge portion or a part of the edge portion.

13. A method for manufacturing a floor base (1), comprising the steps of:

forming a convex portion (11a) integrally projecting to the upper surface side on at least four corners of of a skin (11) formed of a rectangular;

forming a concave portion (11b) on the lower surface of said convex portion;

packing concrete (12) in said concave portion (11b);

hardening said concrete (12); and

forming a prop to be integrated with said skin.

14. A method for manufacturing a floor base, comprising the steps of:

forming convex portions (11a, 11b) integrally projecting to the upper surface side on at least four corners of of a skin (11) formed of a rectangular and a central portion;

forming concave portions (11b, 11d) on the lower surface of each convex portion;

packing concrete (12) in said concave portions;

hardening said concrete (12);

forming a main prop (13) to be integrated with said skin in at least four corners of said skin; and

forming an auxiliary prop (14) to be integrated with said skin in the central of said skin.

15. The method according to claim 13, characterized in that ultra-high-strength special lightweight concrete (12) formed of high-strength inorganic material is packed in concave portions (11b, 11d), and said concrete is hardened in said concave portions by applying vibration to said skin (11).

16. The method according to claim 14, characterized in that ultra-high-strength special lightweight concrete (12) formed of high-strength inorganic material is packed in concave portions (11b, 11d), and said concrete is hardened in said concave portions by applying vibration to said skin (11).

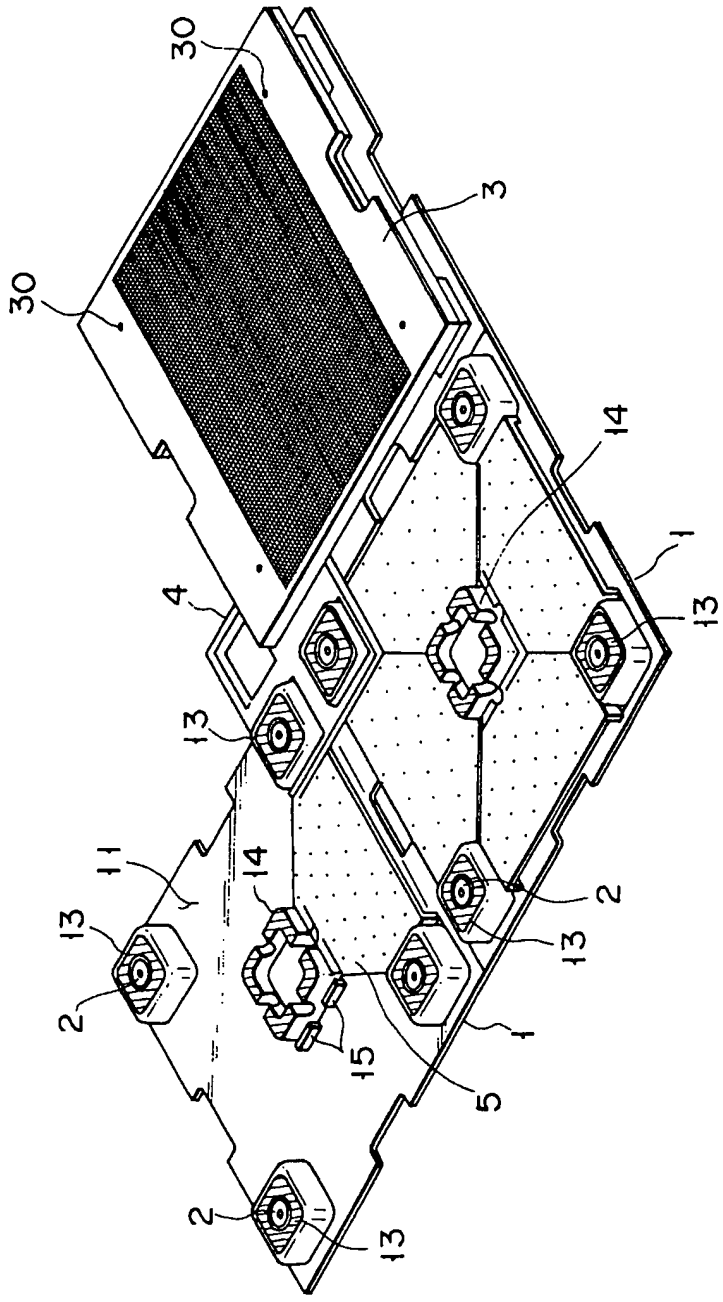

FIG. 1

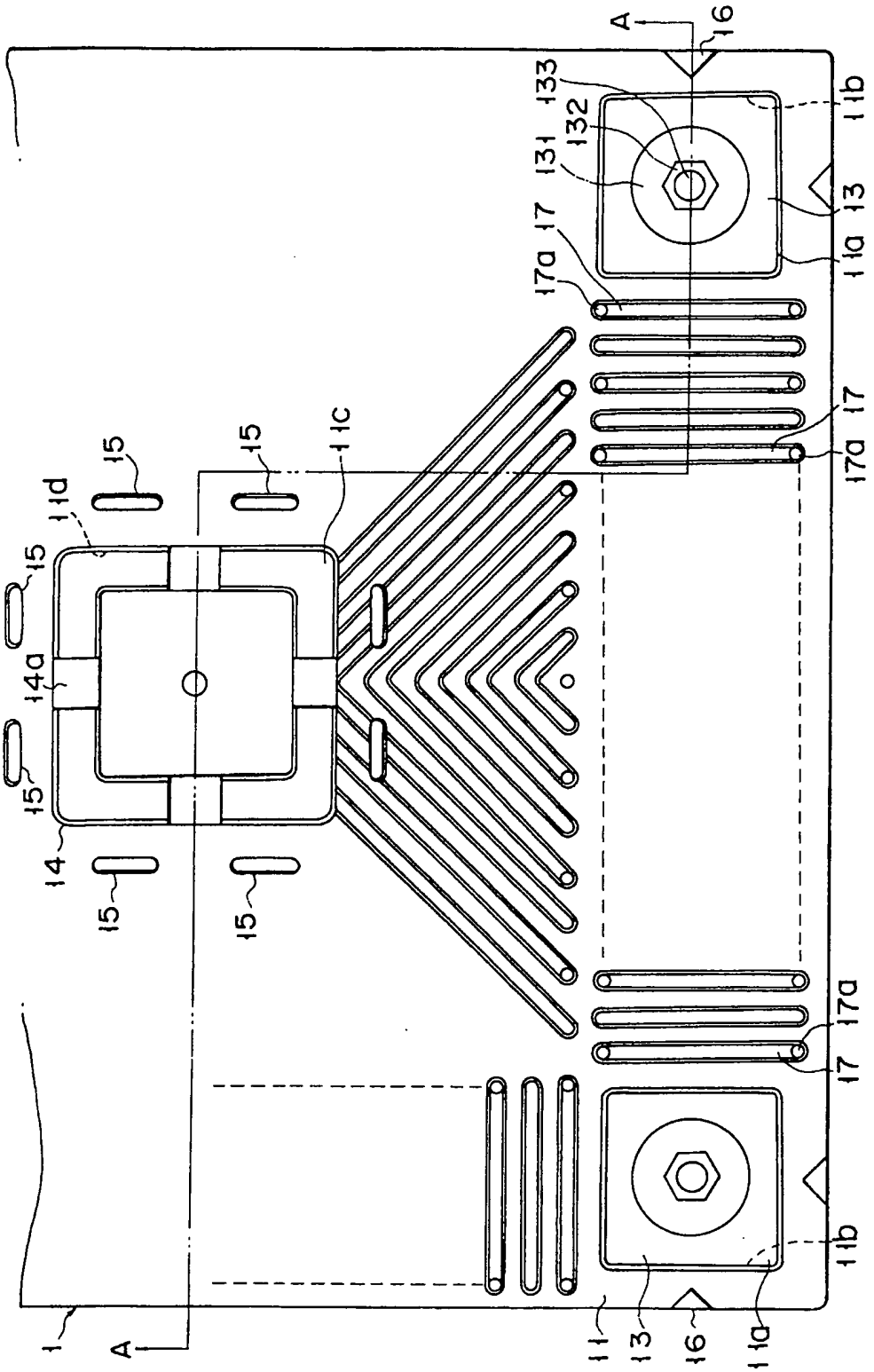

FIG. 2

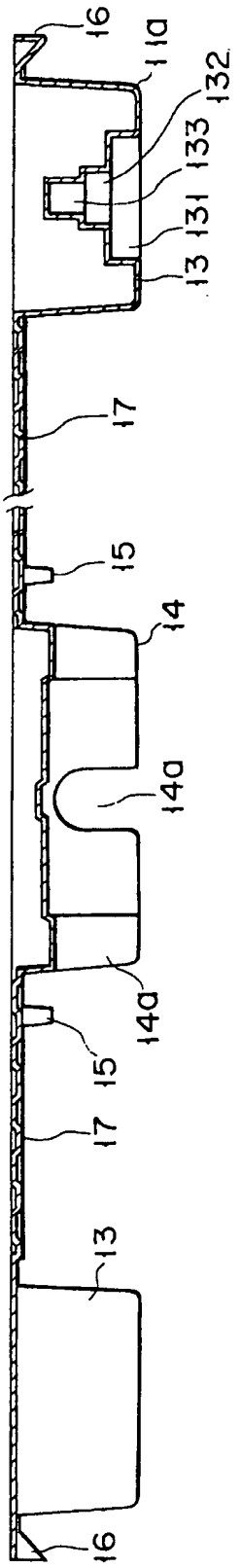
16
11a
132
133
131
13
17
15
14
14a
14a
15
17
13
16

FIG. 3

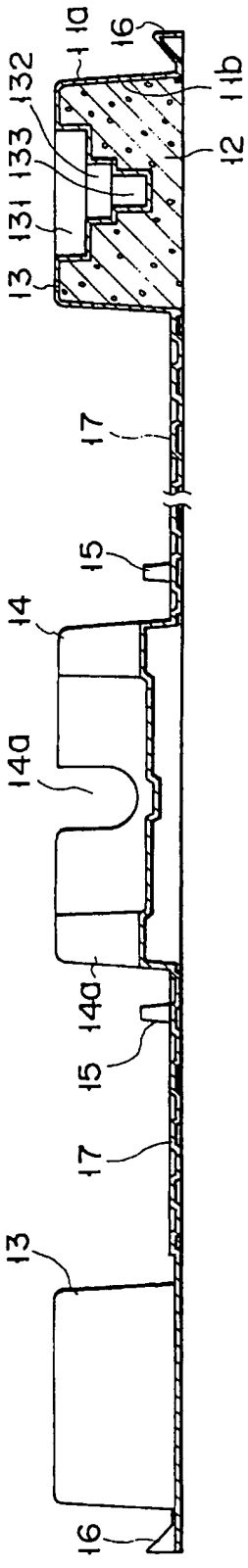
11a
16
132
11b
12
133
131
13
17
15
14
14a
14a
15
17
13
16

FIG. 4

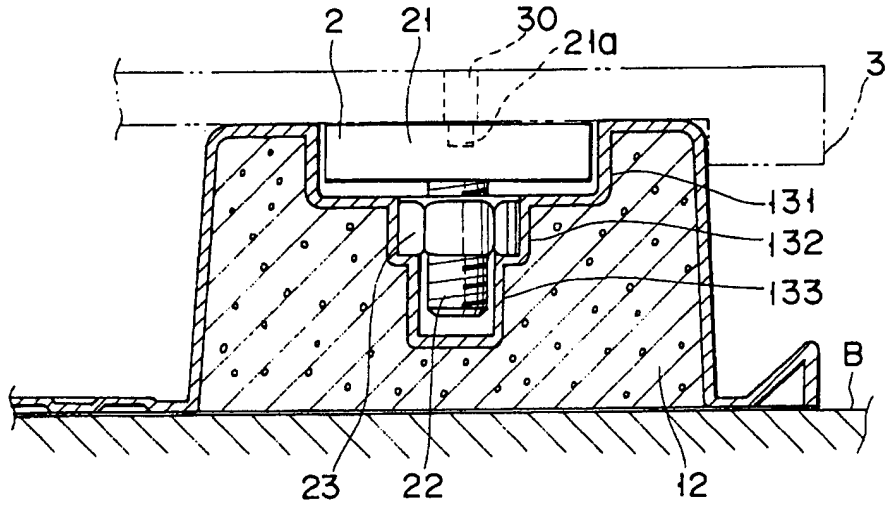

FIG. 5

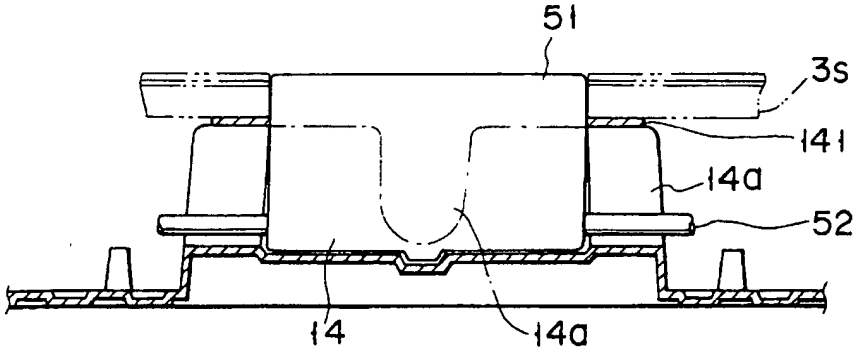

FIG. 6

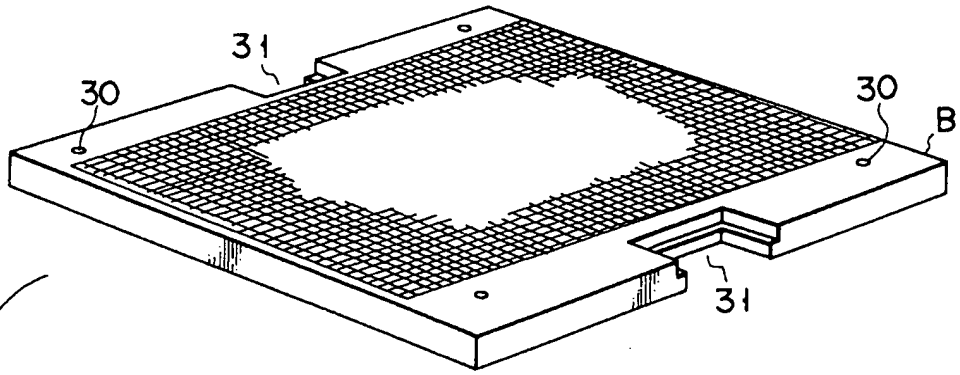

FIG. 7A

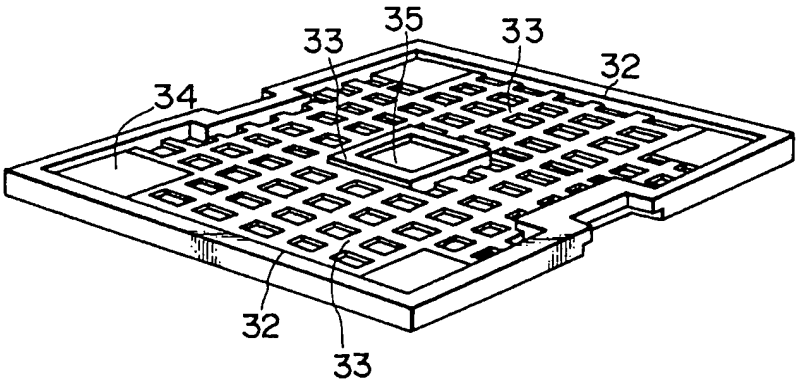

FIG. 7B

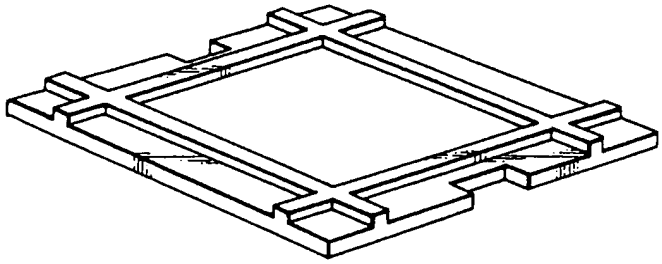

FIG. 8

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 12 0431

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X A	GB-A-2 190 936 (KYODO ELECTRIC CO LTD) * page 2, line 51 - page 3, line 69 * * page 4, line 56 - page 5, line 22 * * page 6, line 23 - line 81 * * page 6, line 88 - line 111; figures 1-15 *	5,6 1,2, 13-16	E04F15/024
A	EP-A-0 367 176 (KABUSHIKI KAISHA TOSHIBA) * column 4, line 12 - column 5, line 49 * * column 7, line 5 - column 9, line 14; figures 1-10 *	1,2,5	
A	EP-A-0 385 876 (FRANCAISE DE DEVELOPPEMENT DE PROCEDES DE BATIMENT, SOCIETE CIVILE) * column 8, line 22 - column 10, line 9 * * column 10, line 28 - line 56; figures 8-13 *	1-5,7, 13,14	
A	EP-A-0 125 914 (KABUSHIKI KAISHA TOSHIBA) * page 5, line 15 - page 6, line 7 * * page 7, line 5 - page 8, line 10 * * page 10, line 34 - page 14, line 10 * * page 14, line 19 - page 15, line 9; figures 1-12 *	1-4	TECHNICAL FIELDS SEARCHED (Int. Cl.5) E04F H02G
A	EP-A-0 218 108 (HERFORDER TEPPICHFABRIK HUCHZERMEYER & CO. GMBH) * page 6, line 22 - page 10, line 22; figures 1-5 *	1,5, 13-16	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	20 FEBRUARY 1992	AYITER J.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
: non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P0401)